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Data Quality Declarations concerning Building Objects in Maps and Registers

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Abstract

This abstract presents a Ph.D.-project related to the Danish research initiative “Infrastructure for Spatial Information” established in co-operation between The National Survey Cadastre, The Copenhagen Business School and Aalborg University and dealing with matters as structuring, modelling, distributing and marketing spatial information. The Ph.D.-project focuses on data quality issues concerning data related to buildings and especially topics related to declaring quality aspects due to the need of making data sets available for a wide range of tasks and user groups.

In Denmark there are old traditions of registering and mapping for different purposes and especially during the last three decades a wide range of national maps and registers have been established due to the specific tasks of the increasing public sector and the need for regulation and taxation.

Most of the Danish national maps and registers have been converted to a digital form during the past twenty years and steps have been taken to standardise and reorganise public databases and loosen up legislation to full-fill government intentions of supporting the information society. To support the interaction between maps and registers an independent key register, the Cross-Reference Register, containing common keys and their relations was established in 1989, and since 1993 a logical data-model concerning property data and a main concept making the address the primary key to administrative databases has been developed. A metadata service “The Info database” was established 1994 by the National Survey and Cadastre and the Technical University and among the latest initiatives which this ph.d.-project is based on the revision of the Building and Dwelling Register including the new address register is of key interest as well as the concept of the Public Information Server launched by the Ministry of Housing and Urban affairs.

Data related to buildings contain a very large potential. Along with the extended use of spatial information technology and the Internet public maps and registers originally defined for specific tasks related to physical planning, taxation of buildings or statistics concerning dwellings et cetera become of more general interest. In different ways we are all private or professional users of information related to buildings and a wide range of other data types have references to these objects.

The main issues of the ph.d.-project are to support sharing and reuse of data related to buildings by:

- Defining public core data sets related to building objects*
- Specifying criteria for declaring data quality related to building objects in order to increase accessibility*

A survey of data flows concerning the Danish maps and registers related to buildings and to property data in general has been conducted in order to define a flexible meta-data model concept able to handle different approaches to describing the contents of these data sets. The model concept aims to be able to visualise how the different data contents is influenced by the processes related to collecting, updating, storing, value-adding, distributing or using data.

Further on a case study based on a Danish city renewal process is carried out in order to analyse user needs. A Danish city-renewal process contains complex interactions between politicians, citizens, planners, as well as other professionals. And due to the various tasks large amounts of data related to buildings are exchanged. Based on existing data in various maps and registers concerning property data city planners locate the renewal area, analyse the impacts, and visualise proposals to citizens and politicians. Chartered surveyors use and update cadastral maps and registers when handling legal and physical affairs related to property transactions. During the building construction processes a lot of information related to designing the buildings, applying for building permissions as well as updating maps and registers is exchanged between the public authorities, architects, engineering companies and privates. And afterwards databases related to different kinds of supplying and facilities management has to be maintained. Regarding commercial tasks for instance dwellings for sale or rent have to be advertised as well as houses have to be insured. Of particular interest for this project is the CIS-CAD concept developed by the Ministry of Housing and Urban affairs 1997-2000. This concept deals with the contradiction that despite the extended use of CAD and IT in general among the professional parties involved in designing buildings most of the information exchange related to the following procedures - for instance in the municipalities - are based on paper. Similarly lots of analysis work done by city planners in the municipalities are still conducted on paper maps though GI-technology is available elsewhere in the organisation. Redundant databases and lack of efficiency considering data maintenance procedures are among others obvious results.

The analysis will be based on modelling data flows and object definitions. In order to create a reliable and accessible framework for the exchange and reuse of information related to buildings a central issue is to define public financed and maintained sets of core data containing standardised objects, geo-references and unique administrative keys. The main approach to specifying data quality declarations is various kinds of meta-data modelling as a mean to retrieve relevant data sets suitable for specific purposes as well as avoiding errors caused by misuse. Due to the complexity of the potential sharing of data in a city renewal process it is expected to be able to draw parallels and generalise results into broader conclusions concerning data quality aspects and information infrastructures in a national perspective as well.